

## CLAIMS

1. Immobilization device for a connecting rod (2) in an osseous anchoring element (3) of a rachidian implant (4), characterized in that it comprises an osseous anchoring element (3) comprising retention means (14, 15) adapted to deform elastically under a pressure force  $F$  and a blocking element (5) comprising on the one hand lugs (33, 34) which coact with the retaining means (14, 15) to permit the securement of the blocking element (5) on the osseous anchoring element (3) and on the other hand, a tightening screw (31) permitting the immobilization in rotation and in translation of the connecting rod (2) between the osseous anchoring element (3) and the blocking element (5).

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2. Immobilization device according to claim 1, characterized in that it comprises: an osseous anchoring element (3) provided with a head (8) comprising two vertical elastic walls (9, 10) delimiting a central U shaped opening (11) whose bottom (12) has a part cylindrical profile, each elastic vertical wall (9, 10) being separated from the bottom (12) of the central opening (11) by a vertical slot (50) giving a certain elasticity to each wall in a direction  $YY'$ , said elastic vertical walls (9, 10) comprising respectively at each end a profile in the form of a hooking blade (14, 15) disposed facing each other and on opposite sides of the central opening (11), said hooking blades (14, 15) comprising respectively in their upper portion a snap-in tooth (19, 20), and a blocking element (5) comprising a cylindrical seat (29), a screw-threaded bore (30) opening within the seat (29), a tightening screw (31) coacting with the screw-threaded bore

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(30) and lugs (33, 34) which coact respectively with a tooth (19, 20) secured to the elastic blades (14, 15).

3. Immobilization device according to claim 2  
5 characterized in that each elastic vertical wall (9, 10) comprises on its internal surface and between the hooking blades (14, 15) a part cylindrical vertical seat (51) having grooves (54) on each side.

10 4. Immobilization device according to claim 2 characterized in that the hooking blades (14, 15) of the head (8) comprise respectively in their upper portion a tooth (19, 20) whose hooking profile (40, 41) is turned inwardly of the central opening (11).

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5. Immobilization device according to claim 4 characterized in that each tooth (19, 20) comprises above its hooking portion (40, 41) and in the direction of the opening (11) an inclined external profile (42, 43)  
20 prolonged in the outward direction by a convexly rounded profile (44, 45).

6. Immobilization device according to claim 2  
25 characterized in that the blocking element (5) comprises a lower surface (24) comprising in a direction parallel to the axis XX' a seat (29) having a part cylindrical profile so as to coact with the connecting rod (2), an upper surface (23) comprising in its middle a screw-threaded bore (30) opening within the seat (29) and in which coacts a  
30 tightening screw (31), and lateral surfaces (25, 26, 27, 28) parallel two by two and of which at least two (27, 28)

are secured respectively to two lugs (33, 34) in the form of teeth.

7. Immobilization device according to claim 6  
5 characterized in that each lateral surface (27, 28) disposed in a plane parallel to the axis XX' of the seat (29) comprises two lugs (33, 34) in the form of teeth comprising hooking portions (48, 49) separated by a vertical seat (52) bordered laterally by ribs (53).

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8. Immobilization device according to claim 6 characterized in that the hooking portions (48, 49) are closed opposite the lateral surfaces (25, 26) by means of the corresponding vertical rib (53).

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9. Immobilization device according to claim 1, characterized in that it comprises: an osseous anchoring element (3) provided with a head (8) comprising two vertical walls (9, 10) delimiting a central opening (11) of  
20 U shape whose bottom (12) has a part cylindrical profile, each vertical wall (9, 10) being constituted by a central surface (13) bordered laterally and on each side by elastic blades (14, 15) separated respectively from said central surface by vertical slots (16, 17), said elastic blades  
25 (14, 15) comprising respectively in their upper portion a snap-in tooth (19, 20) and a blocking element (5) comprising a seat (29) having a part cylindrical profile, a screw-threaded bore (30) opening within the seat (29), a tightening screw (31) coacting with the screw-threaded bore  
30 (30) and lugs (33, 34) which coact respectively with a tooth (19, 20) secured to the elastic blades (14, 15).

10. Immobilization device according to claim 9, characterized in that the central surface (13) of each vertical wall (9, 10) is pierced by a hole (18) opening within the central U shaped opening (11).

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11. Immobilization device according to claim 9, characterized in that the elastic blades (14, 15) of the head (8) comprise respectively in their upper portion a tooth (19, 20) whose external profile (21, 22) is convexly  
10 rounded and inclined.

12. Immobilization device according to claim 9, characterized in that the blocking element (5) has a lower surface (24) comprising in a direction parallel to the axis  
15 XX' of the connecting rod (2), a seat (29) having a part cylindrical profile.

13. Immobilization device according to claim 9, characterized in that the blocking element (5) has an upper  
20 surface (23), opposite the lower one (24), comprising at its middle a screw-threaded bore (30) opening within the seat (29) and in which coacts a tightening screw (31).

14. Immobilization device according to claim 9,  
25 characterized in that the blocking element (5) has a first pair of opposite lateral surfaces (25, 26) comprising respectively above the seat (29) an impression (32) adapted to coact with an instrument for the manipulation and emplacement of said blocking element (5) on the osseous  
30 anchoring element (3).

15. Immobilization device according to claim 9, characterized in that the blocking element (5) has a second pair of opposite lateral surfaces (27, 28) which are each secured to two lugs (33, 34) disposed in the width of said  
5 blocking element and positioned in prolongation of each lateral surface (25, 26).

16. Immobilization device according to claim 9, characterized in that each lug (33, 34) comprises  
10 respectively in its upper portion an inclined or beveled flat (35, 36) whose lower base is positioned in the plane containing each of said lateral surfaces (25, 26).

17. Immobilization device according to claim 9,  
15 characterized in that each lug (33, 34) comprises respectively in its lower portion and opposite the inclined flats (35, 36) a rounded profile (37, 38).

18. Immobilization device according to claim 9,  
20 characterized in that the distance d separating two lugs (33, 34) is less than that provided between two teeth (19, 20) of a same vertical wall (9, 10) of the osseous anchoring element (3).

25 19. Immobilization device according to claim 9, characterized in that the pressure force **F** applied to the blocking element (5) permits by means of lugs (33, 34) and vertical slots (16, 17), the lateral deformation of the elastic blades (14, 15) in the direction of the central  
30 surface (13) of each wall (9, 10) of the osseous anchoring element (3).

20. Immobilization device according to claim 1,  
characterized in that it comprises: an osseous anchoring  
element (3) provided with a head (8) comprising two  
truncated vertical walls (9, 10) delimiting a central  
5 opening (11) of U shape whose bottom (12) has a part  
cylindrical profile, each vertical wall (9, 10) being  
constituted by a central surface (13) bordered laterally  
and on each side by elastic blades (14, 15) separated  
respectively from said central surface by vertical slots  
10 (16, 17), said elastic blades (14, 15) comprising  
respectively in their upper portion a snap-in tooth (19,  
20) and a blocking element (5) comprising a seat (29) with  
part cylindrical profile, a screw-threaded bore (30)  
opening within said seat (29), a tightening screw (31)  
15 coacting with the screw-threaded bore (30) and lugs (33,  
34) which coact respectively with a tooth (19, 20) secured  
to the elastic blades (14, 15).

21. Immobilization device according to claim 20,  
20 characterized in that the head (8) comprises two vertical  
walls (9, 10) of truncated profile disposed one facing the  
other and in parallel planes so as to delimit a first  
central opening (11) of U shape carried by the axis XX' of  
the connecting rod (2) and whose bottom (12) has a part  
25 cylindrical profile, and a second opening (39)  
perpendicular to the axis XX' and to the first opening  
(11).

22. Immobilization device according to claim 21  
30 characterized in that the two perpendicular openings (11,  
39) permit delimiting at each point of the head (8) elastic

blades (14, 15) adapted to deform elastically under a pressure force **F**.

23. Immobilization device according to claim 22  
5 characterized in that the elastic blades (14, 15) of the head (8) comprise respectively in their upper portion a tooth (19, 20) whose hooking profile (40, 41) is turned inwardly of the second opening (39) and above the central surface (13) of each vertical wall (9, 10).

10 24. Immobilization device according to claim 23 characterized in that each tooth (19, 20) comprises above its hooking portion (40, 41) and in the direction of the opening (39), an inclined external profile (42, 43)  
15 prolonged in the outward direction by a convexly curved profile (44, 45).

25. Immobilization device according to claim 20  
20 characterized in that the blocking element (5) comprises a lower surface (24) comprising in a direction parallel to the axis  $XX'$  a seat (29) having a part cylindrical profile so as to coact with the connecting rod (2), an upper surface (23) comprising at its middle a screw-threaded bore (30) opening within the seat (29) and in which coacts a  
25 tightening screw (31), and lateral surfaces (25, 26, 27, 28) parallel two by two and of which at least two (27, 28) are secured respectively to two lugs (33, 34) in the form of a tooth.

30 26. Immobilization device according to claim 25 characterized in that each lug (33, 34) comprises a hooking portion (48, 49) positioned retracted and at a certain

distance  $d_1$  from the lateral and opposite surfaces (25, 26)  
of the blocking element (5).